



APPENDIX:E



**ELMWOOD GENERAL PLAN AND ZONING EIR
ENVIRONMENTAL NOISE ASSESSMENT
MILPITAS, CALIFORNIA**

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INTRODUCTION

The Elmwood General Plan and Zoning Project proposes the development of commercial and residential land uses on approximately 30 acres of County surplus lands west, north, and east of the Elmwood Correctional Facility in Milpitas, California. Included in the Project is the development of 150,000 square feet of automobile sales space, 165 single-family homes, 203 townhouses, 315 condominiums, and a one-acre city park. An alternative of the Project would replace the automobile sales space with 240,000 square feet of shopping center land uses and include an additional 104 apartments to the residential component stated above. The Project site includes three parcels adjoining the Elmwood Correctional Facility. The first parcel is located west of the existing correctional facility, adjacent to Interstate 880, and is to be developed for commercial land uses. The second parcel is located north of the correctional facility, across Hetch Hetchy Way, and is to be developed as residential. The third parcel is located east of the correctional facility, across Abel Street, and is planned with podium style residential uses and a 1-acre city park. Noise sources affecting the Project site include Interstate 880, Abel Street, commercial aircraft traffic and the Elmwood Correctional Facility. The Setting section of this report presents the fundamentals of environmental acoustics, the regulatory background information applicable to this assessment, and a description of the existing noise environment at the Project site. The Impacts and Mitigation Measures Section evaluates the potential for noise impacts resulting from the Project and presents mitigation measures for all identified significant impacts.

SETTING

FUNDAMENTAL CONCEPTS OF ENVIRONMENTAL ACOUSTICS

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is amplitude of sound waves combined with the reception characteristics of the ear. Amplitude may be compared with the height of an ocean wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. The *Decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20

decibels is 100 times more intense, and 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as an approximate doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

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Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
L ₀₁ , L ₁₀ , L ₅₀ , L ₉₀	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L _{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels in the night between 10:00 pm and 7:00 am.
Day/Night Noise Level, L _{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
L _{max} , L _{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

At a Given Distance From Noise Source	A- Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100')	130		
Jet Takeoff (200')	120		Pain Threshold
	110	Rock Music Concert	
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')			
	90	Boiler Room	
Freight Cars (50')		Printing Press Plant	
Pneumatic Drill (50')	80	In Kitchen With Garbage Disposal Running	
Freeway (100')			
	70		Moderately Loud
Vacuum Cleaner (10')	60	Data Processing Center	
		Department Store	

Light Traffic (100')	50	Private Office Business	
Large Transformer (200')			
	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

Typical Sound Levels Measured in the Environment and Industry

Table 2

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There are several methods of characterizing sound. The most common in California is the *A-weighted sound level or dBA*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2.

Because sound levels can vary over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq} . The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level, CNEL*, is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 p.m. - 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. - 7:00 a.m.) noise levels. The *Day/Night Average Sound Level, L_{dn} or DNL*, is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

REGULATORY BACKGROUND

The State of California and the City of Milpitas both have established regulatory criteria designed to guide compatible development in varying noise environments and protect existing uses from excessive noise increases. This noise assessment will address the following regulatory criteria: (1) the State CEQA Guidelines, Appendix G, (2) the State Building Code, and (3) the City of Milpitas General Plan Noise Element.

State CEQA Guidelines

The California Environmental Quality Act (CEQA) asks the following applicable questions to evaluate the significance of potential Project impacts.

Potential noise effects would be considered significant if the Project will result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies?
- A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?
- A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?
- For a Project located within an airport land use plan, or where such a plan has not been adopted within two miles of a public airport, private airstrip, or public use airport, exposure of people residing or working in the Project area to excessive noise levels?

CEQA does not define the noise level increase that is considered substantial. Typically, an increase in the DNL noise level of 3 dB or greater at noise-sensitive receptors would be considered significant when Projected noise levels would exceed those considered satisfactory for the affected land use (60 dB DNL).

California State Building Code

Environmental noise intrusion into new multi-family housing is regulated by Appendix Chapter 12, Section 1208, Sound Transmission Control in the 1998 California Building Code. Interior noise levels attributable to exterior sources shall not exceed 45 dB DNL in any habitable room. Residential structures to be located where the noise level exceeds 60 dB DNL shall require an acoustical analysis showing that the proposed design will limit exterior noise to the prescribed allowable interior level.

City of Milpitas General Plan Noise Element

The City of Milpitas General Plan Noise Element sets forth implementing policies to guide the development of residential and commercial land uses. The following implementing policies would be applicable in the noise assessment:

- 6-I-1** Use the guidelines in Table 6-1 (Noise and Land Use Compatibility) as review criteria for development Projects.
- 6-I-2** Require an acoustical analysis for Projects located within a "conditionally acceptable" or "normally unacceptable" exterior noise exposure area. Require mitigation measures to reduce noise to acceptable levels.

- 6-I-3** Prohibit new construction where the exterior noise exposure is considered “clearly unacceptable” for the use proposed.
- 6-I-4** Where actual or Projected rear yard and exterior common open space noise exposure exceeds the "normally acceptable" levels for new single-family and multifamily residential Projects, use mitigation measures to reduce sound levels in those areas to acceptable levels.
- 6-I-5** All new residential development (single family and multifamily) and lodging facilities must have interior noise levels of 45 dB DNL or less. Mechanical ventilation will be required where use of windows for ventilation will result in higher than 45 dB DNL interior noise levels.
- 6-I-7** Avoid residential DNL exposure increases of more than 3 dB or more than 65 dB at the property line, whichever is more restrictive.
- 6-I-13** Restrict the hours of operation, technique, and equipment used in all public and private construction activities to minimize noise impact. Include noise specifications in requests for bids and equipment information.
- 6-I-15** Promote installations of noise barriers along highways and the railroad corridor where substantial land uses of high sensitivity are impacted by unacceptable noise levels.

Table 6-1 in the General Plan establishes the noise land use compatibility standards for different proposed land uses. For single-family residential land use, up to 60 dB DNL is considered normally acceptable, up to 70 dB DNL is considered conditionally acceptable, and above 70 dB DNL is considered normally unacceptable. For multi-family residential land use, up to 65 dB DNL is considered normally acceptable, up to 70 dB DNL is considered conditionally acceptable, and above 70 dB DNL is considered normally unacceptable. For commercial land uses, an L_{dn} of up to 70 dB DNL is considered normally acceptable, up to 77 dB DNL is considered conditionally acceptable, and above 77 dB DNL is considered normally unacceptable.

EXISTING NOISE ENVIRONMENT

The predominant source of noise throughout the Project area is vehicle traffic. On the west side of the Project site, noise generated along Interstate 880 dominates the noise environment. Noise generated by Abel Street dominates the noise environment at the east side of the Project area. Other noise sources in the vicinity of the Project site include traffic noise generated along South Main Street, the Elmwood Correctional Facility Public Address system, intermittent sirens from the Milpitas Fire Department located near-by and commercial aircraft traffic. Sensitive receptors in the vicinity of the Project

include single-family residential housing to the north of the correctional facility and multi-family residential housing south of the eastern portion of the Project site.

A noise monitoring survey was conducted February 9-11, 2004. Noise levels were monitored continuously over a 24-hour duration at two representative locations at the Project site. The Day-Night Level (DNL) was calculated for each 24-hour measurement. One additional short-term noise measurement was conducted. Measurement locations are shown in Figure 1.

Long-term measurement one (LT-1) was located at the northwest corner of the Elmwood Jail, across Hetch Hetchy Way. This measurement was taken 790 feet from Interstate 880. The dominant noise source was vehicular traffic on Interstate 880, while other noise sources included the Elmwood Correctional Facility, commercial aircraft traffic, and local vehicular traffic on Hetch Hetchy Way. Daytime hourly L_{eq} noise levels typically ranged from about 54 dBA to 63 dBA while nighttime hourly L_{eq} noise levels ranged from about 53 dBA to 63 dBA. The daily average was 65 dB DNL. The daily trend in noise levels measured at site LT-1 is shown on Figure 2.

The second long-term measurement (LT-2) was made across Abel Street from the Elmwood Jail, at the proposed park site. The measurement was about 165 feet from the centerline of Abel Street. The dominant noise source at the measurement location was vehicular traffic on Abel Street. Typical hourly L_{eq} noise levels ranged from about 57 dBA to 62 dBA during daytime hours, and 50 dBA to 61 dBA at night. The daily average was 63 dB DNL. The data measured at this site is shown on Figure 3.

A short-term measurement (ST-1) was conducted on the eastern property line of the Abel Street parcel, about 140 feet from the centerline of South Main Street. This measurement was made to quantify the noise levels generated by vehicular traffic along South Main Street. The measured 10-minute L_{eq} at ST-1 was 60 dBA, while the maximum noise level was 74 dBA. The source of the maximum noise level was a southbound (near lane) bus.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines states that a Project would normally be considered to have a significant impact if the resulting noise levels conflict with adopted environmental standards or plans, or if noise levels generated by the Project would substantially increase existing noise levels either permanently or temporarily. The following criteria were used to evaluate the significance of noise impacts:

Noise and Land Use Compatibility: A significant noise impact would be identified if exterior noise levels at residential areas on the Project site would exceed 60 dB DNL for single-family or 65 dB DNL for multi-family.

Substantial Increase to Noise Levels: The impact would be considered significant if Project-generated traffic increases noise levels at existing noise-sensitive receivers by 3 dB DNL or greater.

Construction Noise: Construction activities produce temporary noise impacts. Since these impacts would be short-term and vary considerably day-to-day, they are evaluated somewhat differently than operational impacts. When construction activities are predicted to generate noise levels greater than 60 dBA $L_{eq(hr)}$, exceed ambient noise levels by 5 dBA or more, and cause prolonged interference with normal activities in noise-sensitive areas, the impact would be considered significant.

IMPACTS AND MITIGATION MEASURES

This section evaluates the potential for a significant noise impact resulting from the Noise and Land Use Compatibility of the proposed residential Project with the future noise environment, and the impact that the proposed Project would have on existing noise sensitive receivers.

Noise and Land Use Compatibility

Portions of the proposed Project site are located in a noise environment that exceeds the satisfactory noise level standard of 65 dB DNL for multi-family residential land uses. Where noise-sensitive areas are exposed to exterior noise levels greater than 60 dB DNL, interior noise levels may also exceed the acceptable noise goal of 45 dB DNL. This is a *potentially significant impact*.

Land East of Abel Street

(A) Outdoor Noise Environment

Podium style high-density residential development is proposed on the east side of Abel Street. The measured noise level east of Abel Street, 165 feet from the centerline of the roadway, was 63 dB DNL. At the facades of the proposed residential units overlooking Abel Street the future noise level is calculated to be 68 dB DNL. Noise exposure in the outdoor areas on the podium around the buildings is calculated to be 60 to 65 dB DNL. Noise exposure in the outdoor areas around the buildings and at the pool area would be compatible for the proposed multi-family podium style development. The outdoor noise environment would, therefore, be compatible with the proposed high-density residential development.

A park is proposed in the eastern study area. The frontage along Abel Street would experience a future noise exposure of 68 dB DNL, but the majority of the park would be exposed to noise levels between 60 and 65 dB DNL. The noise exposure at the park site would be compatible with the intended use.

(B) Indoor Noise Environment

The exterior noise exposure would exceed 60 dB DNL, the State Building Code threshold level for further evaluation of interior noise. Typical new residential construction provides about 15 decibels of noise reduction with windows partially open and about 25 decibels of noise reduction with windows closed. Interior noise levels in units facing Abel Street would be up to 52 dB DNL with windows partially open and 42 dB DNL with windows shut. This represents a ***potentially significant impact***.

Land North of the Elmwood Correctional Facility

(A) Outdoor Noise Environment

Proposed land uses in the Project area north of the Elmwood Correctional Facility are a mix of single-family detached housing and townhomes. This area is affected by noise from Abel Street and I-880. The Elmwood Correctional Facility, itself, was not identified during the noise survey as a significant source of community noise. There may be intermittent noises, but these are not expected to pose any constraint to the proposed residential development of the site. Such noises could include testing of emergency engine generators, vehicles circulating, voices. The existing and future noise exposure level in the western portion of the proposed development area is a DNL of 65 dB resulting from I-880. The noise level in outdoor activity areas would be considered acceptable based on the City's Noise and Land Use Compatibility Guidelines. Furthermore, once the commercial parcel is developed noise from I-880 will be lower due to additional shielding. Along Abel Street the nearest units are proposed about 200 feet from the roadway centerline where the existing and future noise exposure levels are expected to be about 62-63 dB DNL. The townhomes proposed in the eastern segment of the northern study area are, therefore, again compatible with the 65 dB threshold level. The single-family detached housing proposed in the center of the northern site would be buffered from vehicular traffic noise by the townhomes. Noise exposure in this area is expected to be less than 60 dB DNL. It is, therefore, considered acceptable with respect to the City guidelines. Vehicular traffic noise would be acceptable in outdoor activity areas at the proposed residential development.

The area adjacent to I-880 is proposed for auto-related or other commercial development. This type of development is generally considered compatible adjacent to freeways. The proposed development may be a future source of noise which could effect the adjacent new residential development. Of particular concern would be intrusive noise sources such as public address systems that are often utilized at automobile dealerships. This is a ***potentially significant intra-Project impact***.

(B) Indoor Noise Environment

The townhome developments would be exposed to noise levels exceeding 60 dB DNL but not exceeding 65 dB DNL. Interior noise levels, with windows assumed open for ventilation, would therefore exceed the 45 dB DNL standards set forth in the Noise Element and the State Building Code. This is a ***potentially significant impact***.

Mitigation for Noise and Land Use Compatibility:

With the implementation of the following mitigation measures, the interior and exterior noise impacts would be considered ***less-than-significant***.

- A detailed analysis of noise exposure that identifies noise insulation features for units exposed to noise levels exceeding 60 dB DNL shall be conducted before building plans are submitted. The State of California Building Code (enforced by the City for all housing) requires that interior noise levels not exceed 45 dB DNL in all habitable rooms. In accordance with State Building Code requirements, the acoustical analysis should indicate the treatments necessary to maintain indoor noise levels at or below 45 dB L_{dn}. Appropriate building design would be necessary to maintain indoor noise levels to meet City and State requirements.
- Residences with direct exposure to Interstate 880 and Abel Street shall be provided with adequate forced air mechanical ventilation so windows may be kept closed at the discretion of the occupants to control noise intrusion. The following is a list of areas that would require mechanical ventilation.
 - ✓ Units at the west side of the lot north of the correctional facility.
 - ✓ Units at the north and south sides of the lot north of the correctional facility that are less than 1200 feet from the I-880.
 - ✓ Units at the east side of the lot north of the correctional facility that are exposed to noise generated by Abel Street that are less than 250 feet from the centerline of Abel Street.
 - ✓ All units located at the lot east of Abel Street and adjoining the Street.
- The proposed commercial development shall include noise control treatments, as necessary, to be compatible land uses with the adjacent residential development. Such controls may include, but not be limited to, noise barriers along the eastern property line north of the Hetch Hetchy right-of-way, site planning to minimize noise generating activities such as loading docks and repair facilities, etc. adjacent to the common residential property boundary. Such controls shall be sufficient to attenuate noise generated on the commercial site to less than 60 dB DNL at the adjoining residential site boundary.

Traffic Noise Impact on Surrounding Areas

Traffic resulting from the proposed Project would not cause a substantial increase in noise levels at any noise sensitive receptors in the Project area adjoining the street network. This is a *less than significant impact*.

Traffic noise level increases on the street network were calculated by comparing existing traffic volumes to future traffic volumes with the Project. Along Abel Street the Project generated traffic is calculated to cause an increase of 1 dB DNL in the noise exposure. Such an increase is not substantial and would not cause a significant impact upon existing residents adjoining Abel Street. There are no other roadways in the Project vicinity with adjoining noise sensitive land uses that would experience a measurable increase in traffic noise as a result of Project generated traffic. There would, therefore, be a ***less-than-significant*** noise impact resulting from Project generated traffic.

Parking Lot Noise

Noises generated in the guest parking lot/circulation roadway located on the north side of the north Project area would be intermittently intrusive and potentially cause annoyance to adjacent neighbors. *This is a potentially significant impact.*

The residential portion of the study area proposed north of the Elmwood Correctional Facility adjoins an existing single-family residential neighborhood. The circulation road and guest parking area is proposed along the north boundary of the site. The circulation of vehicles, engine-starts, and car-door slamming, as well as conversations, would be occurring immediately adjacent to the residential neighbors to the north. Noise levels would be intermittently intrusive, but would not affect the day/night average level at the neighbors' homes. There would not be a substantial increase in the overall noise exposure level, but the character of the noise environment would be changed.

Mitigation: Construct a 6-foot high solid noise barrier fence along the northern property boundary where it adjoins single-family residences. Such a noise barrier fence could be constructed of wood if air-tight with no cracks or gaps, or concrete panels, or concrete or masonry block. The minimum surface weight for the barrier shall be three pounds per square foot.

Construction Noise Impact

Project construction would elevate noise levels at adjacent residential receptors during the construction period. *This would represent a potentially significant short-term impact.*

Most Project construction activities would take place in a period of less than one year and would include some grading of the site, paving of roadways, construction of Project infrastructure, and construction of individual buildings. The highest noise levels would be generated during grading of the site, with lower noise levels occurring during building construction. Large pieces of earth-moving equipment, such as graders, scrapers, and bulldozers, generate maximum noise levels of 80 to 85 dBA at a distance of 100 feet. Typical hourly average construction-generated noise levels are about 75 to 80 dBA measured at a distance of 100 feet from the site during busy construction periods. These noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor. The closest existing noise sensitive land is the residential area located north of both residential sites and south of the Abel Street site. Existing ambient noise levels at adjacent residences range from approximately 54 to 63 dBA Leq. Construction noise levels at adjacent residences would intermittently exceed 60 dBA Leq and existing ambient levels by more than 5 dBA when construction occurred on the site. At times, noise levels produced by heavy equipment may interfere with normal residential activities during busy construction periods when

construction occurs in areas adjacent to residences that are further from Interstate 80. Construction activities would not typically be located adjacent to a particular receiver during the entire construction period.

Mitigation:

During construction, the following measures to reduce construction noise should be implemented:

- \$ Limit construction to the hours of 7:00 AM to 7:00 PM on weekdays, and 9:00 AM to 5:00 PM on Saturdays, with no noise-generating construction on Sundays or holidays.
- \$ Equip all internal combustion engine-driven equipment with mufflers which are in good condition and appropriate for the equipment.
- \$ Utilize Aquiet® models of air compressors and other stationary noise sources where technology exists.
- \$ Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction Project area.
- \$ Prohibit unnecessary idling of internal combustion engine.
- \$ Designate a Noise disturbance coordinator® who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (e.g., starting too early, bad muffler, etc.) and institute reasonable measures warranted to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site.